

N-沟道超级结功率 MOS 管

N-CHANNEL SUPER JUNCTION POWER MOSFET

SIF65R380

●特点：新高压器件技术 低导通电阻和低传导损耗 封装小 超低栅极电荷导致较低的驱动要求
100%雪崩测试 符合RoHS规范

●FEATURES: ■NEW TECHNOLOGY FOR HIGH VOLTAGE DEVICE ■LOW ON-RESISTANCE AND LOW CONDUCTION LOSSES ■SMALL PACKAGE ■ULTRA LOW GATE CHARGE CAUSE LOWER DRIVING REQUIREMENTS ■100% AVALANCHE TESTED ■ROHS COMPLIANT

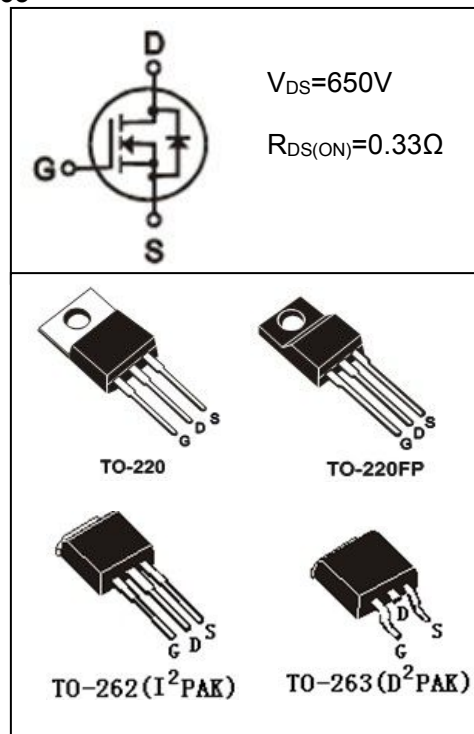
●应用：功率因数校正（PFC） 开关电源（SMPS） UPS 电源

●APPLICATION: ■POWER FACTOR CORRECTION (PFC) ■SWITCHED MODE POWER SUPPLIES(SMPS) ■UNINTERRUPTIBLE POWER SUPPLY (UPS)

●最大额定值（TC=25°C）

●Absolute Maximum Ratings（Tc=25°C） TO-220/220FP/262/263

| 参数 PARAMETER | 符号 SYMBOL | 额定值 VALUE | 单位 UNIT |
|--|------------------|-------------------------|------------|
| 漏-源电压 Drain-source Voltage | V _{DS} | 650 | V |
| 栅-源电压 gate-source Voltage | V _{GS} | ± 30 | V |
| 漏极电流 Continuous Drain Current TC=25°C | I _D | 11 | A |
| 漏极电流 Continuous Drain Current TC=100°C | I _D | 7 | A |
| 最大脉冲电流 Drain Current — Pulsed ① | I _{DM} | 33 | A |
| 耗散功率 Power Dissipation | P _D | Others: 83 220FP: 31 | W |
| 最高结温 Junction Temperature | T _J | 150 | °C |
| 存储温度 Storage Temperature | T _{STG} | -55-150 | °C |
| 漏源电压斜率 Drain Source voltage slope | dV/dt | 50 | V/ns |
| 单脉冲雪崩能量 Single Pulse Avalanche Energy ② | E _{AS} | 272 | mJ |



●热特性

●Thermal Characteristic

| 参数 PARAMETER | 符号 SYMBOL | 最大值 MAX | | 单位 UNIT |
|---|-------------------|-------------------|----------|------------|
| | | TO-220/TO-262,263 | TO-220FP | |
| 热阻结-壳 Thermal Resistance Junction-case | R _{thJC} | 1.5 | 4 | °C/W |
| 热阻结-环境 Thermal Resistance Junction-ambient | R _{thJA} | 62 | 62.5 | °C/W |

●订单信息/ORDERING INFORMATION:

| 包装形式/PACKING | 订货编码/ORDERING CODE | |
|--------------------------------|--|--|
| | 普通塑封料/ Normal Package Material | 无卤塑封料/Halogen Free |
| TO-220 条管装/TUBE PACKING | SIF65R380 TO-220-TU | SIF65R380 TO-220-TU-HF |
| TO-220FP 条管装/TUBE PACKING | SIF65R380 TO-220FP-TU | SIF65R380 TO-220FP-TU-HF |
| TO-262 或 263 条管装/TUBE PACKING | SIF65R380 TO-262-TU 或 SIF65R380 TO-263-TU | SIF65R380 TO-262-TU-HF 或 SIF65R380 TO-263-TU-HF |
| TO-263 编带装/TAPE & REEL PACKING | SIF65R380 TO-263-TR | SIF65R380 TO-263-TR-HF |

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电特性 (Tc=25°C)

● Electronic Characteristics (Tc=25°C)

| 参数 PARAMETER | 符号 SYMBOL | 测试条件 TEST CONDITION | 最小值 MIN | 典型值 TYP | 最大值 MAX | 单位 UNIT |
|---|---------------------|--|------------|------------|------------|------------|
| 漏-源击穿电压 Drain-source Breakdown Voltage | BV _{DSS} | V _{GS} =0V, I _D =250μA | 650 | | | V |
| 漏-源漏电流 Drain-source Leakage Current | I _{DSS} | V _{DS} =650V, V _{GS} =0V, T _J =25°C | | | 1 | μA |
| 栅极漏电流 Gate-body Leakage Current (V _{DS} = 0) | I _{GSS} | V _{GS} =±30V | | | ±100 | nA |
| 栅极开启电压 Gate Threshold Voltage | V _{GS(TH)} | V _{GS} =V _{DS} , I _D =250μA | 2.0 | | 4.0 | V |
| 漏-源导通电阻 Static Drain-source On Resistance | R _{DS(ON)} | V _{GS} =10V, I _D =5.5A | | 0.33 | 0.38 | Ω |
| 跨导 Forward Transconductance | g _{fs} | V _{DS} =10V, I _D =5.5A | | 5.9 | | S |
| 输入电容 Input Capacitance | C _{iss} | V _{GS} = 0V, V _{DS} = 25V F = 1.0MHZ | | 730 | | pF |
| 输出电容 Output Capacitance | C _{oss} | | | 690 | | |
| 反向传输电容 Reverse transfer Capacitance | C _{rss} | | | 7 | | |
| 栅极电荷 Total Gate Charge | Q _g | I _D =11.0A, V _{DS} = 20V V _{GS} = 10V | | 10.5 | | nC |
| 栅源电荷 Gate-to-Source Charge | Q _{gs} | | | 4.5 | | nC |
| 栅漏电荷 Gate-to-Drain Charge | Q _{gd} | | | 2.2 | | nC |
| 栅电阻 Intrinsic Gate Resistance | R _G | f=1MHz open drain | | 5.2 | | Ω |
| 开启延迟 Turn -on Delay Time | T _{d(on)} | V _{DD} =380V, I _D =11A R _G =25Ω V _{GS} =10V | | 26 | | ns |
| 上升时间 Turn -on Rise Time | t _r | | | 28.3 | | ns |
| 关断延迟 Turn -Off Delay Time | T _{d(off)} | | | 34 | | ns |
| 下降时间 Turn -Off Fall Time | t _f | | | 33.2 | | ns |
| 二极管正向电流 Continuous Diode Forward Current | I _{SD} | TC=25°C | | | 11.0 | A |
| 二极管正向压降 Diode Forward Voltage | V _{SD} | T _J =25°C, I _{sd} =11.0A V _{GS} =0V | | 1 | 1.3 | V |
| 反向恢复时间 Reverse Recovery Time | t _{rr} | T _J =25°C, I _f =11.0A di/dt=100A/μs | | 266 | | ns |
| 反向恢复电荷 Reverse Recovery Charge | Q _{rr} | | | 2.8 | | uC |
| 反向恢复电流峰值 Peak Reverse Recovery Current | I _{rrm} | | | 19.6 | | A |

注释(Notes):

① 脉冲宽度: 以最高节温为限制

Repetitive rating: Pulse width limited by maximum junction temperature

② EAS测试条件: VDD=50V RG=25Ω L=10.5mH, T_J=25°C

EAS Test condition: VDD=50V RG=25Ω L=10.5mH, T_J=25°C

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● 特性曲线

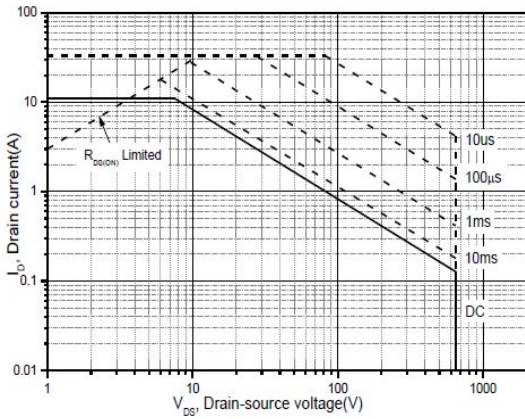


图 1 最大安全工作区曲线 (TO-220)

Fig1 Maximum Safe Operating Area

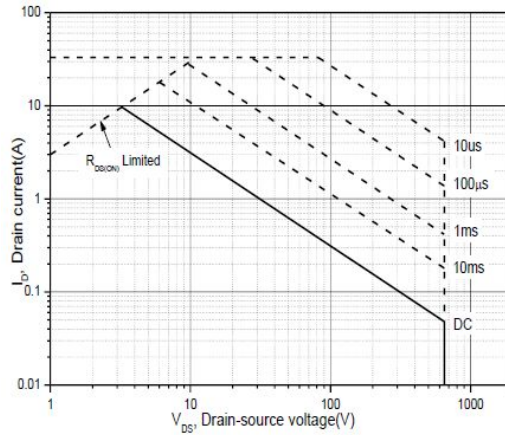


图 2 最大安全工作区曲线 (TO-220FP)

Fig2 Maximum Safe Operating Area

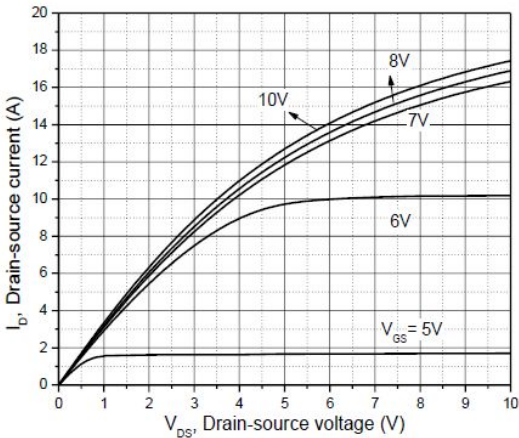


图 3 输出特性曲线, Tc=25°C

Fig3 Typical Output Characteristics

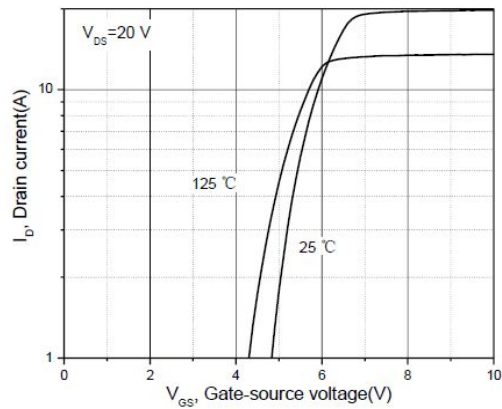


图 4 传输特性曲线

Fig4 Transfer Characteristics

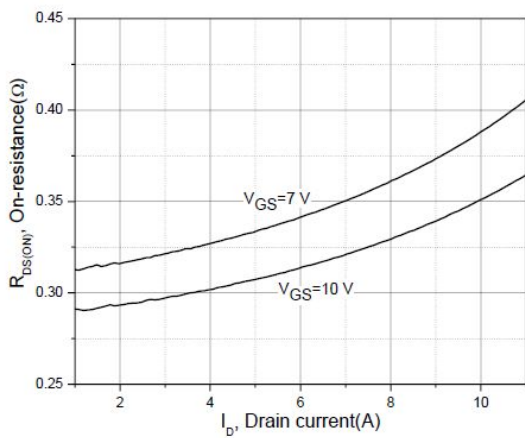


图 5 静态导通电阻与电流曲线

Fig5 Static drain-source On-Resistance

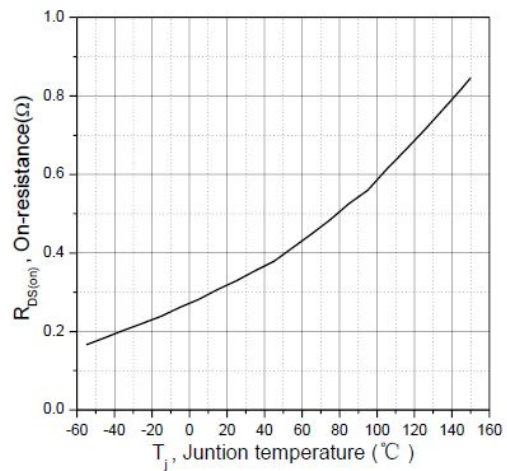


图 6 导通电阻与结温曲线

Fig6 RDSON VS Junction Temperature

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● 特性曲线

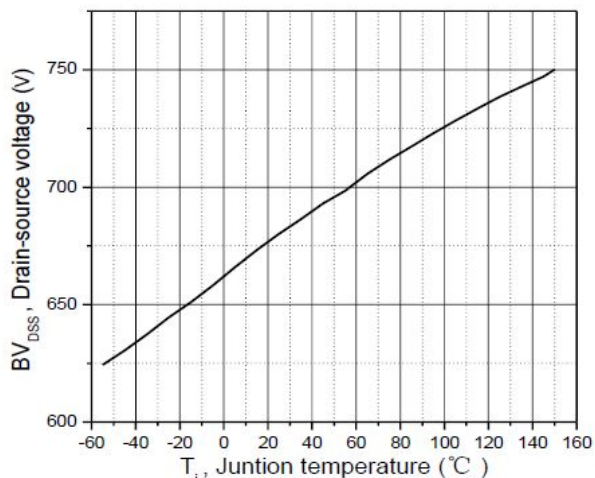


图 7 BVDSS 与结温曲线

Fig7 BVDSS VS Junction Temperature

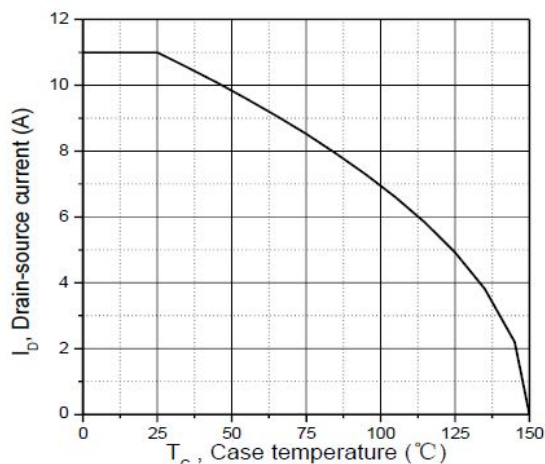


图 8 最大 ID 与结温曲线

Fig8 Maximum ID VS Junction Temperature

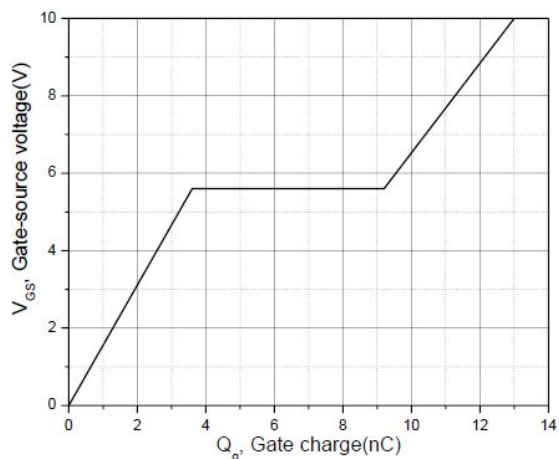


图 9 栅电荷与 VGS 关系曲线

Fig9 Gate Charge waveforms

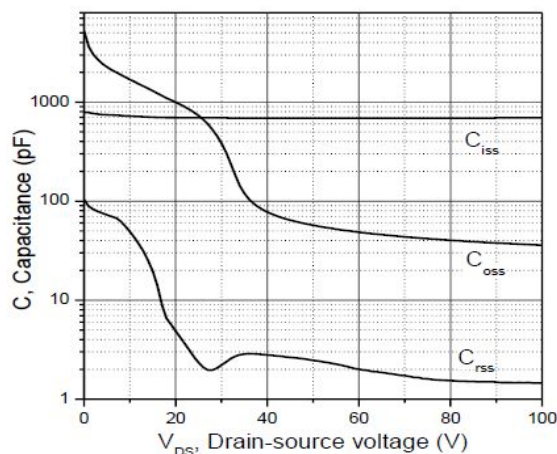


图 10 电容与漏源电压关系曲线

Fig10 Capacitance

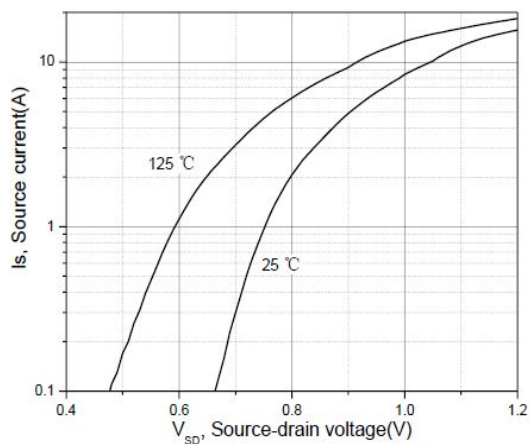


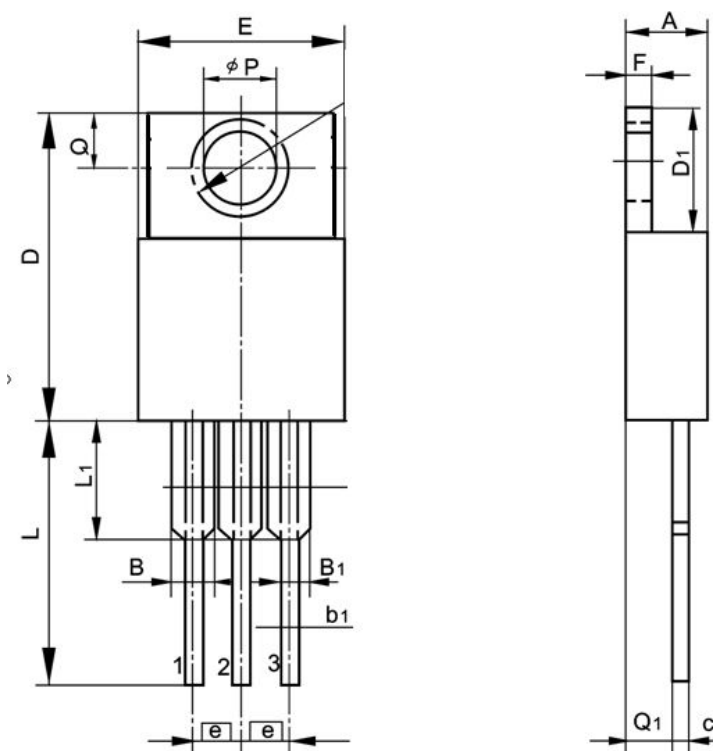
图 11 二极管正向电压曲线

Fig11 Typical Source-Drain Diode Forward Voltage

TO-220 封装机械尺寸 TO-220 MECHANICAL DATA

单位：毫米/UNIT: mm

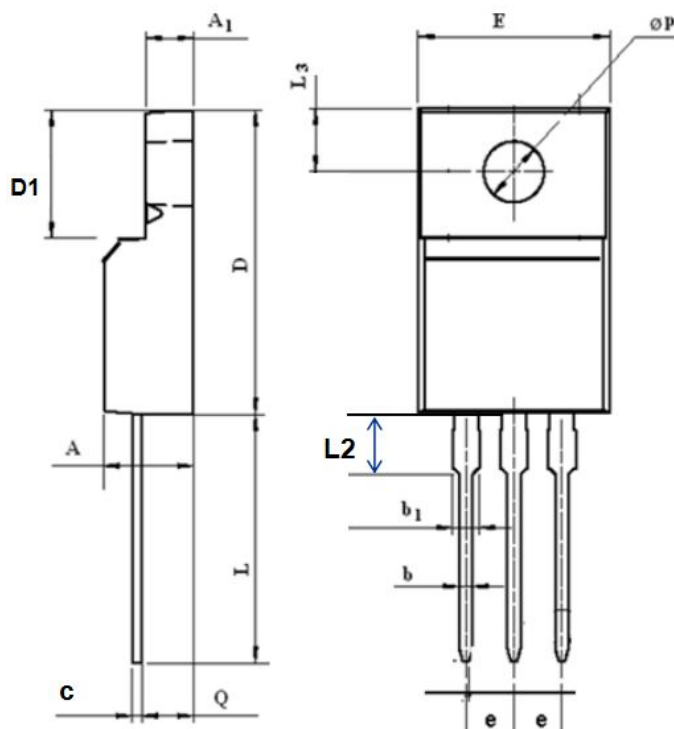
| 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max | 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max |
|--------------|------------|------------|------------|--------------|------------|------------|------------|
| A | 4.00 | | 4.80 | E | 9.90 | | 10.70 |
| B | 1.20 | | 1.50 | e | | 2.54 | |
| B1 | 1.00 | | 1.40 | F | 1.10 | | 1.45 |
| b1 | 0.65 | | 1.00 | L | 12.50 | | 14.50 |
| c | 0.35 | | 0.75 | L1 | 3.00 | 3.50 | 4.00 |
| D | 15.00 | | 16.50 | Q | 2.50 | | 3.00 |
| D1 | 5.90 | | 6.90 | Q1 | 2.00 | | 3.00 |
| | | | | φP | 3.60 | | 3.90 |



TO-220FP 封装机械尺寸 TO-220FP MECHANICAL DATA

单位:毫米/UNIT: mm

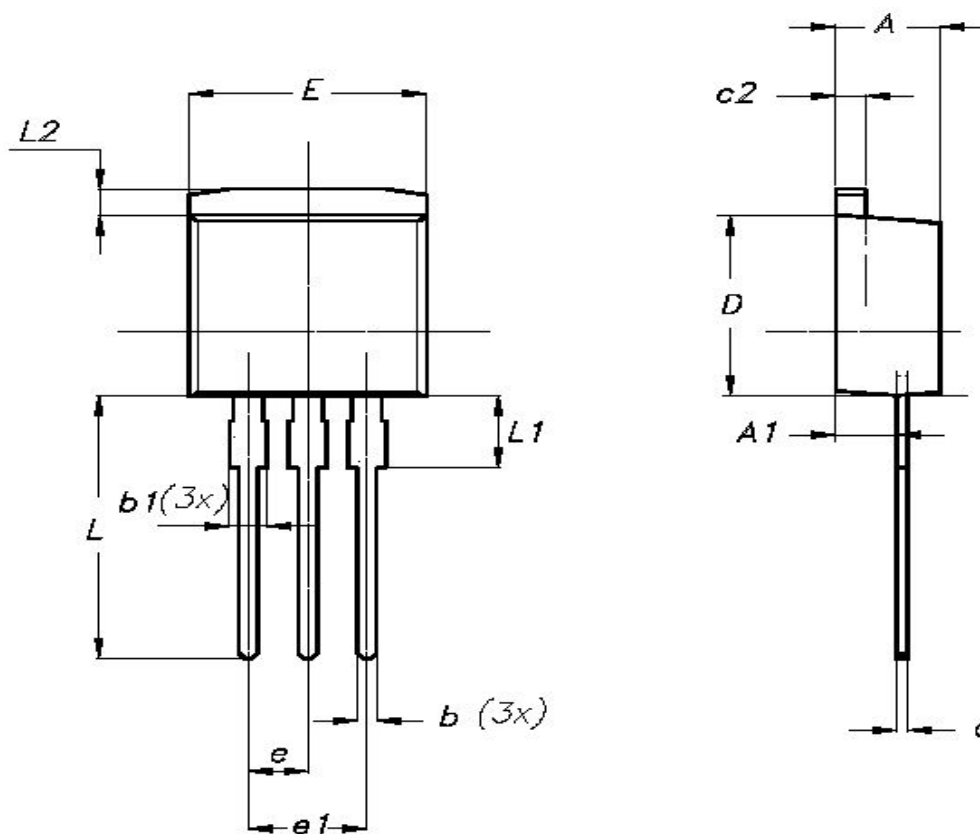
| 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max | 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max |
|----------------|-------------|------------|-------------|----------------------|--------------|------------|--------------|
| A | 4.40 | | 4.95 | E | 9.60 | | 10.30 |
| A ₁ | 2.30 | | 2.90 | e | | 2.54 | |
| b | 0.70 | | 0.90 | L | 12.40 | | 14.00 |
| b ₁ | 1.18 | | 1.45 | L₂ | 2.30 | | 2.60 |
| c | 0.40 | | 0.70 | L ₃ | 3.00 | | 4.00 |
| D | 14.50 | | 17.00 | øp | 3.00 | | 3.50 |
| D1 | 6.10 | | 9.00 | Q | 2.30 | | 2.80 |



TO-262 封装机械尺寸 TO-262 MECHANICAL DATA

单位：毫米/UNIT: mm

| 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max | 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max |
|--------------|------------|------------|------------|--------------|------------|------------|------------|
| A | 3.80 | | 4.80 | e | | 2.54 | |
| A1 | 2.00 | | 2.80 | e1 | | | 5.30 |
| b | 0.60 | | 1.00 | E | 9.90 | | 10.70 |
| b1 | 1.20 | | 1.40 | L | 12.50 | | 14.50 |
| c | 0.40 | | 0.70 | L1 | 0.80 | 1.00 | 1.20 |
| c2 | 1.10 | | 1.40 | L2 | | | 1.50 |
| D | | | 9.60 | | | | |

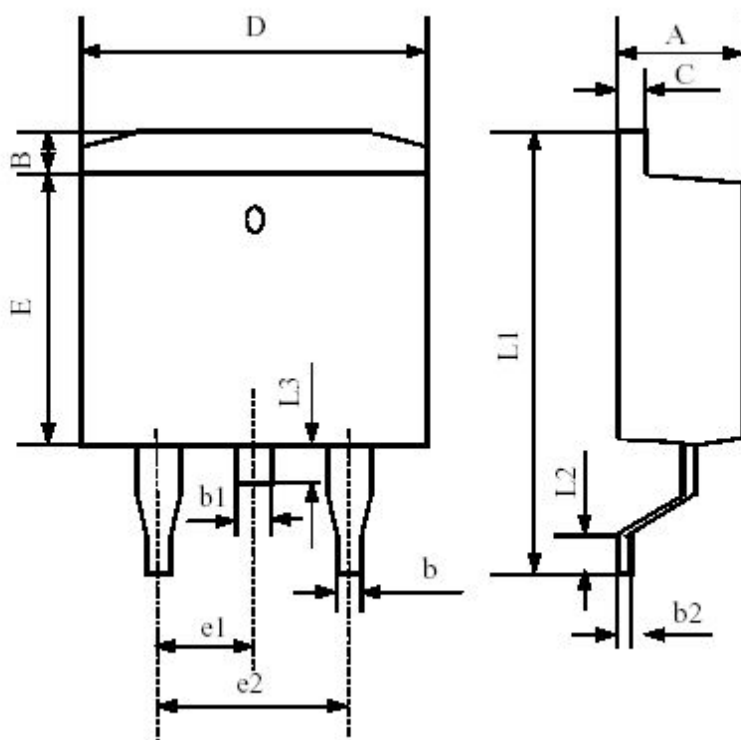


TO-263 封装机械尺寸

TO-263(D2PAK) MECHANICAL DATA

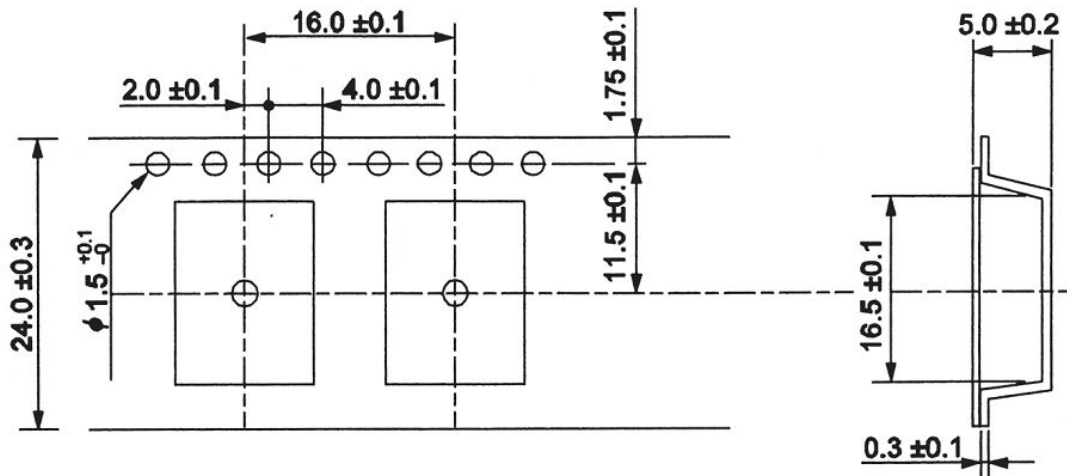
单位：毫米/UNIT: mm

| 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max | 符号 SYMBOL | 最小值 min | 典型值 nom | 最大值 max |
|--------------|------------|------------|------------|--------------|------------|------------|------------|
| A | 4.42 | | 4.72 | E | 8.99 | | 9.29 |
| B | 1.22 | | 1.32 | e1 | 2.44 | | 2.64 |
| b | 0.76 | | 0.86 | e2 | 4.98 | | 5.18 |
| b1 | 1.22 | | 1.32 | L1 | 15.19 | | 15.79 |
| b2 | 0.33 | | 0.43 | L2 | 2.29 | | 2.79 |
| C | 1.22 | | 1.32 | L3 | 1.30 | | 1.75 |
| D | 9.95 | | 10.25 | | | | |

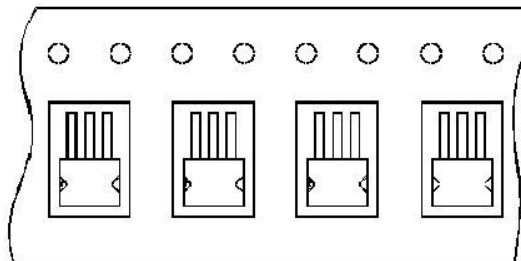


TO-263 编带规格尺寸 TO-263 TAPE AND REEL DATA

单位:毫米/UNIT: mm



使用供带方向/USER DIRECTION OF FEED



编带器件定位示意图/UNIT ORIENTATION